Remarks

Claims 1-8, 10-17 are rejected under 35 U.S.C. 112, first paragraph. Claims 1-18 are rejected under U.S.C. 112, second paragraph. Claims 1, 3-8, 10, 12-17 are rejected under 35 U.S.C. 102(a) as being anticipated by Finkelstein et al. (U.S. 5,586,099). Claims 2 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over the acknowledged prior art in view of Ottesen et al. (U.S. 5,739,994 and 5,787,292). Claims 6, 7, 15, and 16 are further rejected under 35 U.S.C. 103(a) as being unpatentable over the acknowledged prior art in view of Inagaki et al (U.S. 5,568,467). Claims 9 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the acknowledged prior art in view of Dakin et al. (U.S. 4,506,355).

1. Correction of the drawings:

Fig.1 is now properly designated as "Prior art", and a highlighted sketch of this change has been included, with the addition encircled in red. In addition, Fig.6 has been changed to show sufficiently large numbers, letters, and reference characters. Finally, Fig.1 to Fig.8 have been reprinted using proper line quality. Allowance of the corrected drawings is respectfully requested.

2. Correction of the title:

The title has been corrected to form a description that is clearly indicative of the invention to which the claims are directed. Allowance of the correction is hereby requested.

3. Rejection of claims 1-8 and 10-17 under U.S.C. 112, first paragraph:

Claims 1-8 and 10-17 are rejected under 35 U.S.C. 112, first

paragraph, as based on a disclosure that is not enabling. The valid address recognition/ability is critical or essential to the practice of the invention, but not included in the claims is not enabled by the disclosure. As disclosed, nothing occurs unless/until valid address is determined. Such is necessary for the invention as disclosed to continue to operate. This limitation is not found in either of the independent claims 1 or 10. This limitation is found in dependent claims 9 and 18. The examiner strongly urges that this limitation be included in both of the independent claims.

Response:

Amended claims 10 and 1 teach an optical storage carrier drive and an access controlling method used in an optical storage carrier drive, respectively. It is well known in the art of optical storage carrier drives that addressing indexes are used for indexing the data units on the track of an optical carrier, which is the limitation stated in claims 9 and 18.

The limitation stated in claims 9 and 18 is not included in amended independent claims 1 and 10 because other methods of obtaining the associated data block of a data unit may be possible, and hence need not have to be performed in the manner that claims 9 and 18 suggest. For example, if the data blocks each contain the same number of data units (X), then the data block within which a data unit with an address of (Y) is in would be given by: data block = Y div X. Only when the data blocks have differing numbers of data units, respectively, does it then become necessary to have a lookup table with given address ranges for each data block. Consequently, the Applicant respectfully suggests that incorporating the limitations of claims 9 and 18 into claims 1 and 10, respectively, would be

unduly limiting. Moreover, as the above-noted index number determination method is well-known (consider, for example, the determination of a scan line at which a pixel address lands on a display), and as such methods could be used without undue experimentation on the part of another, that claims 1 and 10 are, in fact, enabled under 35 U.S.C. 112, 1st paragraph.

It is believed that the limitations stated in claims 9 and 18 are not essential to understanding the present invention according to amended claims 1 and 10. Reconsideration of claims 1-18 is therefore politely requested.

4. Rejection of claims 1-18 under U.S.C. 112, second paragraph:

Claims 1-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to point out and distinctly claim the subject matter which applicant regards as the invention. As disclosed with respect to figure 3, this is described as a "single track", i.e. a spiral track. This is not what is depicted in this figure. The examiner interprets this figure to be a zone block (concentric tracks) format and not a spiral track.

Response:

The applicant submits that Fig.3 shows a spiral track. To aid in reading this figure, the applicant respectfully suggests tracing along the spiral track. By tracing along the track from the outer section towards the inner section, or vice versa, it becomes clear that Fig.3 depicts a spiral track and not concentric tracks. Alternatively, the Examiner may wish to start at a central portion of the track, and trace the track around to either the inside or outside region. However, such a spiral track may be arbitrarily partitioned into logical

concentric blocks, of which the data blocks of the present invention serve as an example. Differences between physical partitioning and logical partitioning are well known in the art of storage media. Reconsideration of claims 1-18 is respectfully requested.

5. Objection to claim 18:

Claim 18 is objected to as attempting to cross both method and apparatus limitations found in the independent claims. The examiner is not sure what the limitations of this claim are limited to.

Response:

Claim 18 has been amended to overcome this objection. In particular, a clerical error that erroneously stated "method" instead of "optical storage carrier drive" has been corrected. Reconsideration of the amended claim 18 is respectfully requested.

6. Discussion of joint inventors:

The subject matter and all claims regarding this invention were commonly owned by the four joint inventors. These four joint inventors are Meng-Shin Yen, William Wai Wang, Tso-Tsai Chen, and Chi-Hung Chen.

7. Rejection of claims 1, 3-8, 10, and 12-17 under 35 U.S.C. 102(a):

Claims 1, 3-8, 10, and 12-17 are rejected under 35 U.S.C. 102(a) as being anticipated by Finkelstein et al. (U.S. 5,586,099) for reasons of record, as recited in previous office action (paper 3).

Response:

Finkelstein et al. (hereinafter Finkelstein) use different laser power levels when reading an optical disk. As shown in the first sentence of the abstract, Finkelstein teaches raising or lowering the power level of the laser beam when reading at different radii of the optical disk. A flowchart of Finkelstein's method is shown in Fig.4. In step 91, changes in the radius are detected. In step 92, appropriate changes to the power level of the laser beam are made. Essentially, Finkelstein teaches a control method in which **laser power is a function of the radial position of an optical read sensor.**

On the other hand, the present invention teaches a control method in which **constant linear velocity is a function of the data block location of a data unit.** This is expressed, for example, by the lines in the amended claim 1 that read as:

> "determining a targeted data block within which the targeted data unit is located;
> utilizing the lookup table to obtain a targeted constant linear velocity corresponding to the targeted data block;
> controlling the rotative mechanism to provide the targeted constant linear velocity for the targeted data unit..."

Note, in particular, that each data block spans across several physical radial positions of the track, which is expressed by the limitation:

> "wherein each data block includes at least a first and a second data unit, and angular velocity of the rotative mechanism corresponding to the first data unit is not equal to angular velocity of the rotative mechanism corresponding

to the second data unit in order to maintain the constant linear velocity within the associated data block."

Each of the independent claims, namely the amended claims 1 and 10, of the present invention contain these limitations. To help in understanding the key feature of the present invention according to the amended claims 1 and 10, please refer to Fig.5.

Fig.5 shows that a CD is divided into four different data blocks. Data block Z1 is closest to the center of the CD, and data block Z4 is on the outer edge of the CD. When writing to data within a specific data block, the rotation of the CD is controlled such that **the CD maintains a constant linear velocity (CLV) for each data block**. In order to maintain the CLV, angular velocity of the CD is varied slightly. Since it is desired to put less stress on the motor of the CD drive, the angular velocity is limited to a very small range, namely W_0 to W_2 as shown on Fig.5. Furthermore, the range of angular velocity is exactly the same for each data block on the CD. In order to allow the angular velocity to stay in this small range, the CLV level is raised for data blocks that are farther from the center of the CD. Thus, the CD drive has the advantage of using CLV while putting less stress on the motor.

Amended claims 1 and 10 teach that there is a plurality of data units in each data block. The present invention differs from Finkelstein in that at least two data units in each data block do not have the same associated angular velocity of the CD. That is, the CD is rotated at different angular velocities when writing to each of the two data units in each data block.

Finkelstein neither teaches nor suggests the idea of each

data block of a CD having a CLV associated with each data unit within the data block. Indeed, Finkelstein does not teach the concept of logically partitioning the disk into data blocks, each of which has its own CLV value. The applicant submits that the present invention according to amended claims 1 and 10 is thus substantially different from the method taught by Finkelstein. Moreover, claims 3-8 and 12-17 are respectively dependent on the amended claims 1 and 10 and should be allowed if the amended claims 1 and 10 are allowed. Reconsideration of claims 1, 3-8, 10, and 12-17 is politely requested.

8. Rejection of claims 2 and 11 under 35 U.S.C. 103(a):

Claims 2 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over the acknowledged prior art in view of Ottesen et al. (U.S. 5,739,994 and 5,787,292) for reasons of record, as recited in previous office action (paper 3).

Response:

Claims 2 and 11 are respectively dependent on the amended claims 1 and 10 and should be allowed if the amended claims 1 and 10 are allowed. Reconsideration of claims 2 and 11 is politely requested.

9. Rejection of claims 6-7 and 15-16 under 35 U.S.C. 103(a):

Claims 6-7 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over the acknowledged prior art in view of Inagaki et al (U.S. 5,568,467) for reasons of record, as recited in previous office action (paper 3).

Response:

Claims 6-7 and 15-16 are respectively dependent on the amended claims 1 and 10 and should be allowed if the amended

claims 1 and 10 are allowed. Reconsideration of claims 6-7 and 15-16 is politely requested.

10. Rejection of claims 9 and 18 under 35 U.S.C. 103(a):

Claims 9 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the acknowledged prior art in view of Dakin et al. (U.S. 4,506,355) for reasons of record, as recited in previous office action (paper 3).

Response:

Claims 9 and 18 have been canceled and are no longer in need of consideration.

11. Introduction of claim 19:

Claim 19 is introduced in order to provide an apparatus claim consistent with the method of the amended claim 1.

12. Introduction to the amended claims:

Claims 1 and 10 have been amended to more clearly define and point out the present invention, and to correct minor grammatical errors. Support for such amendments can be found in paragraphs [0023]-[0027] of the specification as filed, and in Fig.5. In particular, it appears that there was some confusion as to how constant linear velocity (CLV) is respectively applied to each data block, and in particular to every data unit within that data block. Also, the definition of a data block is made clearer in that such a data block should include at least two data units whose respective angular velocities must be different to obtain their identical CLV.

Claims 3, 8, 12, and 17 have been amended to conform to new claim terminology in their respective base claims. As noted previously, claim 18 has been amended to correct a clerical mistake.

Version with markings to show changes made

In the title:

replace
"CD-RW DRIVE WITH MULTI-STAGE LINEAR VELOCITIES AND DIFFERENT RECORDING SPEEDS AND RECORDING POWERS FOR EACH STAGE"
with
--OPTICAL STORAGE CARRIER DRIVE WITH MULTI-STAGE LINEAR VELOCITIES AND ACCESS CONTROLLING METHOD--.

In the claims:

1. (Amended) An access controlling method used in an optical storage carrier drive, the optical storage carrier drive comprising a rotative mechanism for rotating an optical storage carrier, a data access device for recording data to a track formed on the optical storage carrier, and a look-up table, the track comprising a plurality of data units, each data unit capable of passing by the data access device for recording data thereon, the plurality of data units being sequentially divided into at least two data blocks including a first data block and a second data block, the look-up table [storing] respectively providing a constant linear velocity [corresponding] applicable to each data block, the method comprising [steps of]:
selecting a targeted data unit from the plurality of data units;
determining a targeted data block [where] within which the targeted data unit is located [, the targeted data block corresponding to one of the first and the second data blocks];
[determining] utilizing the lookup table to obtain a targeted

constant linear velocity corresponding to the targeted data block [through reading the look-up table];

controlling the rotative mechanism [rotated in] to provide the targeted constant linear velocity for the targeted data unit; and

recording data to the targeted data unit by moving the data access device to the targeted data unit,

wherein each data block includes at least a first and a second data unit, and angular velocity of the rotative mechanism corresponding to the first data unit is not equal to angular velocity of the rotative mechanism corresponding to the second data unit in order to maintain the constant linear velocity within the associated data block.

3. (Amended) The controlling method of claim 1 wherein the first data block is positioned farther away from a center of the storage carrier than the second data block, the constant linear velocity corresponding to the first data block being higher than the constant linear velocity corresponding to the second data block.

8. (Amended) The controlling method of claim 1 wherein the rotative mechanism of the optical storage carrier drive comprises a rotational speed controller capable of maintaining [a] the constant linear velocity [(CLV) of the rotative speed] of the rotative mechanism [, so that when the data access device records data from the first data block, the linear velocity of the data block passing by the data access device remains constant].

10. (Amended) An optical storage carrier drive for recording data to a track formed on an optical storage carrier, the track comprising a plurality of data units, and the plurality of data units being divided into at least two data blocks including

a first data block and a second data block, the carrier drive comprising:

a rotative mechanism for rotating the optical storage carrier;

a data access device for recording data to the track of the optical storage carrier, the data units capable of passing by the data access device at a constant linear velocity; and

a control device for controlling operations of the optical storage carrier drive, the control device having a look-up table which [stores]provides a [corresponding]respective constant linear velocity [corresponding]applicable to each data [unit,]block;

wherein when the control device records data to a targeted data unit, the control device utilizes the look-up table to [determine]obtain a targeted [data block]constant linear velocity corresponding to a targeted data block within which [where] the targeted data unit is located, controls the rotative mechanism [rotated with]to provide the constant linear velocity [corresponding to the targeted data block]for the targeted data unit, and then records data into the targeted data unit by moving the data access device to the targeted data unit; and

wherein each data block includes at least a first and a second data unit, and angular velocity of the rotative mechanism corresponding to the first data unit is not equal to angular velocity of the rotative mechanism corresponding to the second data unit in order to maintain the constant linear velocity within the associated data block.

12. (Amended) The optical storage carrier drive of claim 10 wherein the first data block is positioned farther away from a center of the optical storage carrier than the second data block,

the constant linear velocity corresponding to the first data block being larger than the constant linear velocity corresponding to the second data block.

17. (Amended) The optical storage carrier drive of claim 10 wherein the rotative mechanism comprises a rotational speed controller capable of maintaining [a] the constant linear velocity [(CLV) of the rotative speed] of the rotative mechanism [, so that when the data access device records data from the first data block, the linear velocity of the data block passing by the data access device remains constant].

18. (Amended) The optical storage carrier drive of claim 10 wherein each data unit comprises an addressing index for indexing the data units on the track, [and] the look-up table further stores a valid address range corresponding to each data block, and the [controlling method] optical storage carrier drive [searching] searches the addressing index of the targeted data unit from the valid address range in order to determine the targeted data block.

Add the following claim:

19. An optical storage carrier drive for practicing the method of claim 1.

Respectfully submitted,

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